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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

ENTROPIC COMMUNICATIONS, LLC,

Plaintiff,

v.

COX COMMUNICATIONS, INC., *et al.*,

Defendants.

ENTROPIC COMMUNICATIONS, LLC,

Plaintiff,

v.

COMCAST CORPORATION, *et al.*,

Defendants.

Case No. 2:23-cv-1049-JWH-KES (Lead Case)

Case No. 2:23-cv-01050-JWH-KES (Related Case)

ENTROPIC COMMUNICATIONS, LLC'S OPENING CLAIM CONSTRUCTION BRIEF; DECLARATION OF VINCENT GALLUZZO IN SUPPORT THEREOF; DECLARATION OF JOHN HOLOBINKO IN SUPPORT THEREOF; REBUTTAL DECLARATION OF JOHN HOLOBINKO IN SUPPORT THEREOF;

Hearing Date: July 23, 2024
Hearing Time: 10:00 a.m.
Courtroom: 9D (Santa Ana)

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I. INTRODUCTION

Plaintiff Entropic Communications, LLC ("Entropic") brought suits alleging infringement of ten patents against Defendants Cox Communications, Inc., CoxCom LLC, Cox Communications California, LLC, Comcast Corporation, Comcast Cable Communications, LLC, and Comcast Cable Communications Management, LLC (collectively, "Defendants"). Of those ten patents, the parties dispute the meaning of certain claim terms in only three: U.S. Patent Nos. 8,223,775 ("'775 Patent"); 8,284,690 ("'690 Patent"); and 10,135,682 ("'682 Patent").[1]

Entropic's proposed constructions for the disputed terms are consistent with both the intrinsic evidence and prior judicial determinations regarding these same terms. Defendants, by contrast, disregard both. As an example from the '682 Patent, Defendants propose—based largely on extrinsic evidence—to construe the term "cable modem termination system," or "CMTS," as "equipment" that must be placed in a single, specific location. But the '682 Patent explicitly says that its invention, which is performed by a CMTS, may be implemented in "hardware, software, or a combination thereof" and may be "distributed." When this same issue—and the same evidence—was presented to the District Court for the Eastern District of Texas during summary-judgment briefing, that Court rejected Defendants' position as contrary to the '682 Patent. The same result should apply here. Defendants repeat these same errors with each of the other disputed terms: they ignore the intrinsic evidence, inject irrelevant extrinsic evidence to contradict the patents, and disregard the decisions of prior courts. Defendants' proposals should be rejected, and Entropic's should be adopted.

[1] Copies of the '775, '690, and '682 Patents are attached as Exhibits A, B, and C respectively to the Galluzzo Declaration.

II. OVERVIEW OF THE PATENTS AT ISSUE

A. '775 Patent

The '775 Patent, titled "Architecture for a Flexible and High-Performance Gateway Cable Modem," relates generally to a novel architecture for cable modems. The '775 Patent discloses various embodiments providing a "highly flexible, high performance system capable of handling multiple cable modem voice, data and networking services," wherein cable modem functions are "completely partitioned" from data networking functions. *See* '775 Patent, 1:61–2:4. In disclosed embodiments, this partitioning is accomplished functionally "by localizing data networking functions in the data networking engine processor and localizing cable modem functions in the cable modem engine processor." *Id.* at 4:16–19.

B. '690 Patent

The '690 Patent describes the use of dynamic probes to "characterize the communication channel over which data is to be sent between nodes of the network." *See* '690 Patent, 1:41–43. In the prior art, probes were commonly "predetermined" by the transmitting node. *See id.* at 1:52–59. This process suffered from a lack of flexibility in the characterization process. *Id.* at 1:57–59. To address this problem, the '690 Patent describes how "[t]he receiving node may generate a probe request that specifies a plurality of parameters to be used in such a 'receiver determined' probe to generate a probe having the 'form' specified by these parameters." *Id.* at 2:3–6. After receiving the request, the transmitting node can generate a responsive probe "base[d] upon one of the parameters of the probe request or based upon information that previously existed within the transmitting node." *Id.* at 6:42–45. This dynamically requested probe can then be used for "OFDMA sub-channel assessment" or "for off-site network diagnosis," among other uses. *See id.* at 2:22–27; *see also id.* at 4:25–27.

C. '682 Patent

The '682 Patent, titled "Method and System for Service Group Management in a Cable Network," relates generally to organizing cable modems (CMs) into service groups based on signal-to-noise ratio (SNR) related metrics. The '682 Patent describes how a cable modem termination system (CMTS) may "determine, for a plurality of cable modems served by the CMTS, a corresponding plurality of SNR-related metrics." '682 Patent, Abstract. Specifically, for example, the CMTS can "determine one or more measured performance metric(s) (*e.g.*, an SNR-related metric such as SNR at a particular frequency or SNR over a range of frequencies (an SNR profile), noise levels, strength of desired signals, and/or the like) for any particular CM 112_x." *Id.* at 3:55–59. The specification describes how the CMTS may assign cable modems to service groups based on a cable modem's SNR-related metrics. *See id.* at 5:37–39, 8:7–9. The patent further describes that these group assignments can then be used to configure "physical layer" parameters, which in turn optimizes communication parameters like overall network reliability. *Id.* at 5:46–50.

III. LEGAL PRINCIPLES

A. Claim Construction

The words of a patent claim "are generally given their ordinary and customary meaning," as would be understood by a person of ordinary skill in the art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005). "There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution." *Thorner v. Sony Computer Entertainment America LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

To begin, "the claims themselves provide substantial guidance as to the meaning of particular claim terms." *Phillips*, 415 F.3d at 1314. The Court also looks to the rest of the intrinsic evidence, beginning with the patent's specification and

concluding with the prosecution history. *Interactive Gift Exp., Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001). Courts are also authorized to consult extrinsic evidence, such as dictionaries and treatises. *Phillips*, 415 F.3d at 1317. However, the Federal Circuit has cautioned that "while extrinsic evidence can shed useful light on the relevant art . . . it is less significant than the intrinsic record in determining the legally operative meaning of claim language." *Id.* (quotations omitted); *see also id.* at 1318. Extrinsic evidence, including testimony of expert witnesses, cannot vary or contradict the terms of the claims. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 981 (Fed. Cir. 1995).

B. Indefiniteness

The Supreme Court of the United States has "read [35 U.S.C.] § 112, ¶ 2 to require that a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). This standard "mandates clarity, while recognizing that absolute precision is unattainable." *Id.* A term is not indefinite where "the patent 'provides a general guideline and examples sufficient to enable a person of ordinary skill in the art to determine the scope of the claims.'" *Nevro Corp. v. Bos. Sci. Corp.*, 955 F.3d 35, 39 (Fed. Cir. 2020) (quoting *Enzo Biochem. Inc. v. Applera Corp.*, 599 F.3d 1325, 1335 (Fed. Cir. 2010). "Indefiniteness must be proven by clear and convincing evidence." *Sonix Tech. Co., Ltd. v. Publ'ns Int'l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017).

IV. PERSON OF ORDINARY SKILL IN THE ART

Whether for claim construction or indefiniteness, claim terms are viewed from the perspective of a person of ordinary skill in the art ("POSITA"). *Lazare Kaplan Int'l v. PhotoScribe Tech's, Inc.*, 628 F.3d 1359, 1368 (Fed. Cir. 2010). Here, a POSITA "would have been an engineer with at least a bachelor's degree in electrical engineering (or equivalent), with at least two years of experience developing broadband/cable TV/satellite communication systems and solutions." Declaration of

J. Holobinko ("Holobinko Decl.") ¶ 31. Within these criteria, "[a]dditional education may substitute for professional experience, and significant work experience may substitute for formal education." *Id*.

V. CONSTRUCTION OF TERMS

A. '775 Patent

1. "wherein the cable modem functions performed by the cable modem engine are completely partitioned from the home networking functions performed by the data networking engine"

Entropic's Construction	Defendants' Construction
Plain and ordinary meaning, as defined by the E.D. Tex.: "wherein the cable modem engine and the data networking engine are not necessarily physically separate but are functionally separate such that the cable modem functions are performed only by the cable modem engine and the home networking functions are performed only by the data networking engine."	Ordinary and customary meaning

Both parties agree that this term should be given its plain and ordinary meaning. The parties' dispute, however, arises from Defendants' refusal to agree that the claimed "complete[] partitioning" of the cable-modem and data-networking engines requires these engines only to be "functionally separate." But this requirement (and the rest of Entropic's construction), is consistent with the intrinsic record and taken verbatim from a prior judicial determination of the meaning of this term. *See Entropic Communications LLC v. Charter Communications Inc.*, No. 2:22-cv-00125-JRG, 2023 WL 4181266, at *7–10 (E.D. Tex. June 26, 2023). Defendants provide no reason for departing from the intrinsic record or the prior construction.

The prior construction resolved the same dispute regarding the meaning of "completely partitioned" presented here, and correctly construed the term's plain meaning consistent with the intrinsic evidence. As Entropic's construction reflects, the claims use "completely partitioned" in the context of the separation of ***functions***, not hardware components. Thus, claim 18 states that "cable modem ***functions***" are "completely partitioned from the home networking ***functions***." '775 Patent, 8:23–27 (emphasis added). This conveys to a POSITA that the claimed partitioning relates to functionality, not necessarily physical separation of hardware.

The specification reinforces this understanding. The '775 Patent defines "Functional Partitioning" as localizing the ***functions*** of the cable modem and data networking engines in different "engines":

> Functional Partitioning. Cable modem 100 completely partitions data networking functions (advanced bridging/routing, NAT/firewall, VPN, web server and CableHome applications) from DOCSIS cable modem functionality. This is accomplished by localizing data networking functions in the data networking engine processor and localizing cable modem functions in the cable modem engine processor.

'775 Patent, 4:13–19; *see also* 1:20–29 (referring to partitioning of "functions").

The '775 Patent also makes clear that the "partitioning" need not involve physical separation that blocks off the claimed "engines" from each other. For instance, the patent explains that processed packets may be forwarded along a data path 118, which connects the cable modem and data networking engines. This path is indicated in Figure 1, as shown below.

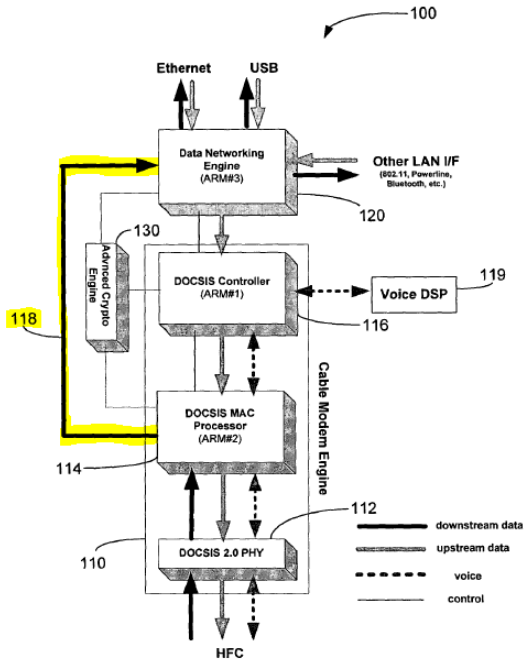

Figure 1

'775 Patent, Fig. 1 (highlighting added); *see also* 3:15–17 ("DS PDU packets are forwarded by [the DOCSIS MAC processor] directly to data networking engine 120 along path 118, bypassing controller 116"). Because the specification discloses that the cable modem engine and the data networking engine are connected and communicate via a data bus, they are not physically partitioned; there is no barrier between them, and they are not disconnected or blocked from communicating. *See Charter*, 2023 WL 4181266 at *8 (finding that existence of this data path "impl[ies] that such communication is not inconsistent with the cable modem engine and the data networking engine being 'completely partitioned' from one another").

As noted above, in prior litigation regarding the scope of this same term in the same patent, the court determined that a POSITA would have understood the term to have the meaning that Entropic proposes. *See Charter*, 2023 WL 4181266 at *7–10. In reaching this conclusion, the prior court determined that the intrinsic record—including the claim language and specification disclosures discussed above—shows that the claimed partitioning allows for elements to be functionally separated but still

connected; physical separation is thus not required. *Id*. This conclusion is well-reasoned and grounded in the intrinsic evidence, and there is no reason to depart from it here. *Deckers Outdoor Corp. v. Romeo & Juliette, Inc.*, No. 2:15-cv-2812, 2016 WL 7017219, at *2 (C.D. Cal. Dec. 1, 2016) ("Deferring to prior constructions tends to promote intrajurisdictional uniformity in claim interpretation.") (citing *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 391 (1996)).

Defendants propose ordinary and customary meaning, but have refused to agree to the term's prior construction or agree that the claimed "partitioning" may be functional. Yet Defendants cite nothing that would justify a different meaning. The intrinsic evidence Defendants cite for their "ordinary and customary meaning" includes the same disclosures from the '775 Patent as Entropic identified above, including the language of claim 18 and the discussion of "functional partitioning" in the specification. *See* Dkt. No. 301 (Joint Claim Construction Statement) at A-1. Thus, Defendants' own citations reinforce that Entropic's construction is correct.

Defendants also cite portions of the file history. *Id*. The file history, however, accords with Entropic's construction. During prosecution, the applicant distinguished a piece of prior art called "Brooks" for lacking functional separation. Galluzzo Decl. Ex. D (June 7, 2010 Response to Final Office Action) at 9. For instance, the applicant argued that Brooks "does not implement a complete partitioning or a completely decoupled arrangement of the data networking engine from the cable modem engine" because it discloses executing "data networking ***functionality***" together with "typical DOCSIS MAC ***functionality***" (*i.e.*, cable modem engine functionality). *See id.* (emphasis added). The Texas court also analyzed the file history and reached the same conclusion: "[t]he patentee thus distinguished Brooks as lacking ***functional*** separation." *Charter*, 2023 WL 4181266 at *9.

Although Defendants have not explained their plain meaning, their refusal to agree to Entropic's construction suggests they intend to argue at trial that the "partition[ing]" requires the two engines to be physically separate. As noted above,

such a requirement is contrary to both the intrinsic evidence and the Texas court's analysis, which explicitly rejected it. *See id.* at *7–10. And even if Defendants agree that "plain meaning" includes functional partitioning, Entropic's construction should still be adopted to clarify the meaning of "partitioned" for the jury. While ***physical*** separation might be how a lay person understands "partitioned," the technical understanding of that term in the context of the '775 Patent includes a ***functional*** separation. Entropic's construction clarifies this for the jury and explains what the plain meaning of the term means to a POSITA in view of the '775 Patent.

B. '690 Patent

1. "content payload"

Entropic's Construction	Defendants' Construction
Plain and ordinary meaning	"data to be transmitted in the probe"

Defendants' proposed construction is not found anywhere in the patent and contradicts the intrinsic evidence. The intrinsic evidence does not dictate a special meaning for "content payload," and thus it should be given its plain meaning.

Defendants' proposed construction has no support in the '690 Patent, which never defines the "content payload" of a probe in the manner that Defendants propose. *Cf. Thorner v. Sony Computer Entertainment America LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) ("To act as its own lexicographer, a patentee must 'clearly set forth a definition of the disputed claim term' other than its plain and ordinary meaning"). Instead, Defendants appear to have crafted their construction out of whole cloth, creating uncertainty and potential conflict with the intrinsic evidence.

As best Entropic can discern, Defendants' construction appears to be adapted from the following statement in the '690 Patent: "A PHY payload is used to transmit the data content of the packet." *See* '690 Patent, 3:57–58. But this statement refers to ***packets***, not ***probes***, which are distinct. It cannot justify a departure from the plain meaning of "probe," for multiple reasons.

First, the "content payload" of the claims is the "content payload ***of the probe***," not of a packet. *See* '690 Patent, 13:49 (emphasis added). The '690 Patent describes a "probe" as including any "reference signal" that is sent between nodes of a network for comparison to a stored reference signal at the receiving node. *Id.* at 1:48–57. A probe signal is broader than a "packet" and can take forms that do not include or comprise a "packet." Indeed, the District Court for the Eastern District of Texas previously rejected an attempt to equate "probe" with "packet." There, the defendant (Charter) had proposed a construction of "probe" that defined it as a "packet." *Charter*, 2023 WL 4181266 at *20. The Texas court rejected that proposal because "[t]he specification . . . refers more broadly to a probe 'signal.'" *Id.* at *22. For the same reason, Defendants' attempt to define the payload content of a ***probe*** based on disclosures regarding a ***packet*** should be rejected.

Second, as both the claims and specification recognize, the payload of a probe may comprise "symbols." *See* '690 Patent at 2:12–13, 2:38–39, 13:66. As used in the '690 Patent, a symbol represents a combination of phase and amplitude as used in, for example, quadrature amplitude modulation (QAM). *Id.* at 4:39–64. These symbols do not represent "data" in the sense of information that a user would want to consume, such as streaming data. *Cf. id.* at 3:62–64 (payload of a packet may include "media streaming transmission"). Thus, the payload of a ***probe*** (*e.g.*, symbols) should not be defined by the payload of a ***packet*** (*e.g.*, "data"). Defendants' proposal requires the payload content to include "data," to the apparent exclusion of symbols. This proposal contradicts both the claims and the specification and cannot be correct.

Ultimately, it is unclear whether Defendants' construction reflects confusion over the technology or is a purposeful attempt to set the table for some future argument that "data" is narrower than any reference signal. In either case, Defendants' proposal is contrary to the '690 Patent's description of probes as—consistent with ordinary meaning—reference signals that may contain symbols. This

Court should reject Defendants' attempt to confuse "probes" with "packets" and hold that "content payload [of the probe]" has its plain and ordinary meaning.

C. '682 Patent

1. "cable modem termination system (CMTS)"

Entropic's Construction	Defendants' Construction
Plain and ordinary meaning, wherein the CMTS may be realized in hardware, software, or a combination of hardware and software, and may be realized in a centralized or distributed fashion	"equipment at which the cable modem's connection to the hybrid-fiber coaxial network terminates"

Entropic's construction of "CMTS" respects the specification, which explicitly describes CMTSes as taking many forms: they can be implemented in hardware or in software as well, and the claimed inventive functions of a CMTS can be centralized or distributed. Defendants' proposal, in contrast, improperly contradicts the intrinsic evidence by limiting a CMTS to only the "equipment" directly connected to cable modems. Defendants thus seek to exclude precisely what the specification includes—a CMTS that uses distributed hardware and associated software and/or firmware.

"When construing claim terms, we first look to, and primarily rely on, the intrinsic evidence." *Sunovion Pharms., Inc. v. Teva Pharms. USA, Inc.*, 731 F.3d 1271, 1276 (Fed. Cir. 2013). Here, each part of Entropic's construction is taken directly from the intrinsic record.

First, the specification explicitly confirms that a CMTS includes hardware ***and*** associated software. According to the '682 Patent, a CMTS "may comprise circuitry operable to manage connections to the CMs [Cable Modems]." '682 Patent, 2:61–62.) In turn, the patent explains, "'circuitry' refer[s] to physical electronic components (i.e. hardware) ***and any software and/or firmware ('code') which may configure the hardware, be executed by the hardware, and or otherwise be associated with the hardware***." *Id.* at 2:32–36 (emphasis added). This broad

description stands in stark contrast to Defendants' suggestion that a CMTS is limited to equipment directly connected to cable modems (*i.e.*, equipment at the terminal end of the cable modem's connection).

Reinforcing the point, the '682 Patent states that "the present invention may be realized in hardware, software, or a combination of hardware and software." *Id.* at 7:31–33. Claim 1 defines "the present invention" as a series of specific steps, each of which is performed "by the CMTS." *See e.g., id.* at 8:2–22. Thus, by saying that "the present invention may be realized in hardware, software, or a combination of hardware and software," the '682 Patent necessarily allows the portions of the CMTS that perform the claimed steps to take any of those forms. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) ("It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'") (citation omitted).

Second, the specification allows the claimed functions of the CMTS to be implemented in a centralized fashion (*i.e.*, a single location) or a distributed one (*i.e.*, spread across multiple locations). According to the '682 Patent, "[t]he present invention may be realized in a centralized fashion in at least one computing system, or in a distributed fashion where different elements are spread across several interconnected computing systems." '682 Patent, 7:33–36. Again, claim 1 requires that each step of "the present invention" is performed "by [a or the] CMTS." *See e.g., id.* at 8:2–22. Thus, if these steps can be "realized in a centralized fashion . . . or in a distributed fashion," the CMTS that performs them may also be implemented in either fashion—exactly as Entropic's construction proposes.

Although the extrinsic evidence cannot contradict the unambiguous statements of the '682 Patent, it too supports Entropic's construction. John Holobinko, Entropic's expert, has years of experience working with and designing CMTSes at companies like Motorola Mobility and others. Holobinko Decl. ¶¶ 13–15. As of 2012—the priority date of the '682 Patent—Mr. Holobinko had personally designed

CMTSes that were implemented in both "hardware and software." Holobinko Decl. ¶ 43. As Mr. Holobinko explains, "[i]t was common for certain CMTS functions to be performed or controlled by offsite systems and software"—that is, they were distributed. *Id.*; *see also* Galluzzo Decl. Ex. E (Holobinko Deposition Tr.) at 61:2–6, 62:19–64:20. Mr. Holobinko's first-hand experience confirms that the '682 Patent uses "CMTS" consistent with the term's use in the relevant technical field.

Defendants' expert, Dr. Chatterjee, focuses on an assortment of extrinsic evidence—a technical specification, a dictionary, two textbooks, and pictures of two CMTSes. *See* Galluzzo Decl. Ex. F (Chatterjee Decl.) at ¶¶ 52–65. But "[e]xtrinsic evidence may not be used 'to contradict claim meaning that is unambiguous in light of the intrinsic evidence." *Profectus Tech. LLC v. Huawei Techs. Co., Ltd.*, 823 F.3d 1375, 1380 (Fed. Cir. 2016). As set forth above, the intrinsic record unambiguously confirms that "CMTS" has the meaning Entropic proposes. Dr. Chatterjee's extrinsic citations thus have no weight. Indeed, another court already rejected one of Dr. Chatterjee's arguments for that exact reason. Dr. Chatterjee opines that the cable-industry standard "DOCSIS" supports Defendants' construction. Chatterjee Decl. ¶¶ 52–54. But Charter Communications—facing allegations of infringement of the same '682 Patent—previously argued, just as Defendants do, that DOCSIS defined a CMTS as equipment located at a cable television headend. *Entropic Communications LLC v. Charter Communications, Inc.*, No. 2:22-cv-00125-JRG, Dkt. No. 354 at 4 (E.D. Tex. Nov. 28, 2024) (Report and Recommendation, adopted at Dkt. No. 398). Magistrate Judge Payne of the Eastern District of Texas rejected this argument, holding that it "conflicts with [the '682] patent's discussion that the invention may be implemented in a distributed manner." *Id.*[2] This Court should do likewise.

[2] Judge Payne's finding came in the context of a motion for summary judgment brought by Charter, arguing that its systems did not infringe because the term "CMTS" should be read in accordance with the DOCSIS definition. Charter did not raise the issue at the *Markman* stage.

Dr. Chatterjee's few attempts to engage with the intrinsic evidence are also flawed. Dr. Chatterjee argues that claim 7 recites using "distances between said CMTS and said cable modems" as a basis for assigning cable modems to service groups. *See* Chatterjee Decl. ¶ 68. According to Dr. Chatterjee, "there could only be a 'distance' between the CMTS and a cable modem if the CMTS is a piece of hardware with a specific spatial position, and not solely 'software,' which could be executed at an unspecific spatial position." *Id*. But an inference from a single dependent claim cannot contradict the explicit intrinsic evidence Entropic cited above. And even if Dr. Chatterjee is right, claim 7 suggests only that a CMTS can include some hardware that, like any physical object, has a "specific spatial position." That does not support Defendants' much narrower proposal—that a CMTS is ***limited*** to equipment directly connected to the cable network's termination point.[3]

Therefore, "CMTS," as used in the '682 Patent and as understood in the art, may be realized in hardware, software, or a combination of hardware and software, and may be realized in a centralized or distributed fashion.

2. "SNR-related metric"

Entropic's Construction	Defendants' Construction
Plain and ordinary meaning	Indefinite

The term "SNR-related metric" has, to a POSITA, readily-understandable boundaries, informed by the claim language, six specific examples in the'682 Patent, and basic technical knowledge. A claim term is not indefinite if it, "viewed in light of the specification and prosecution history, inform[s] those skilled in the art about

[3] Dr. Chatterjee further argues that because "[t]he '682 patent also describes that the CMTS 'may comprise circuitry operable to manage connections,'" "it is referring to hardware equipment, not software." Chatterjee Decl. ¶ 69. But, as set forth at *supra* 15, the '682 Patent describes "circuitry" as comprising hardware and "any ***software*** and/or firmware ('code') which may configure the hardware, be executed by the hardware, and or otherwise be associated with the hardware." '682 Patent at 2:32–36 (emphasis added).

the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). Courts recognize that "absolute precision is unattainable" and "the certainty which the law requires in patents is not greater than is reasonable, having regard to their subject-matter." *Id.*, *citing Minerals Separation, Ltd., v. Hyde*, 242 U.S. 261, 270 (1916). Because "SNR-related metric" easily clears that bar, it is not indefinite.

The indefiniteness analysis "begin[s] with the language of the claims." *Sonix Tech. Co., Ltd. v. Publications Int'l, Ltd.*, 844 F.3d 1370, 1378 (Fed. Cir. 2017). It "turn[s] next to the written description, to determine whether there is some standard" for evaluating the term in question. *Id.* Here, both the claims and specification provide guidance to a person of skill in the field as to the scope of an "SNR-related metric."

First, claim 1 confirms that "SNR" refers to a "signal-to-noise ratio." '682 Patent, 8:5. In the communications field, "noise" has a specific meaning: "unwanted disturbances" or "interference" on a circuit or channel that distorts a desired signal. Rebuttal Declaration of J. Holobinko ("Holobinko Rebuttal") ¶¶ 7, 8. A "signal," in contrast, carries the "information content" being sent over the channel. *Id*. The presence of noise decreases the quality of signals received over a channel. *Id*. By rendering some of the encoded data being sent over the channel indecipherable, it also has a negative impact on the signaling channel's information-carrying capacity.[4] *Id.* at ¶¶ 8, 9. Thus, the claim itself provides guidance to one of skill in the art as to what an "SNR-related metric" is: like SNR, it is a metric indicating the quality or information carrying capacity of a signal. *See id.* at ¶ 11.

Second, the claims and specification confirm the term's definiteness by providing information about how an "SNR-related metric" can be identified or

[4] In the communications field, the signal quality given the presence of noise indicates how much information a signal can carry across a channel, which was recognized as far back as Shannon's pioneering work on information theory in 1949. *See* Holobinko Rebuttal ¶ 8; *see also* Holobinko Exhibit I.

selected. The Federal Circuit has repeatedly found that where a patent "provide[s] guidance and points of comparison for skilled artisans," as to a term's scope, by offering "examples of [the term in question] and procedures for selecting them," the term is not indefinite. *Sonix Tech. Co., Ltd. v. Publications Int'l Ltd.*, 844 F.3d 1370, 1378 (Fed. Cir. 2017); *Enzo Biochem, Inc. v. Applera Corp.*, 599 F.3d 1325, 1334 (Fed. Cir. 2010) (claim term not indefinite where "[t]he specification provides additional examples of [the term], including some criteria for selecting them").

Here, the '682 Patent informs a POSITA about the scope of an "SNR-related metric" by providing six "examples" that provide "points of comparison" for a POSITA. *See Sonix*, 844 F.3d at 1378. The specification explicitly lists four specific examples of SNR-related metrics: "[1] SNR at a particular frequency or [2] SNR over a range of frequencies (an SNR profile), [3] noise levels, [4] strength of desired signals, and/or the like." '682 Patent, 3:56–59. Two more examples are listed in U.S. Patent Application No. 13/948,401 ("'401 Application"), which the '682 Patent incorporates by reference. *See id.* at 1:38–40, 1:44–45 (incorporating '401 Application). As the '401 Application notes, a "measured performance metric may be, for example, an SNR-related metric such as [the four examples above, and] . . . [5] bit error rate, [6] symbol error rate, and/or the like." Galluzzo Decl. Ex. G ('401 Application) 3:40–44. These six examples of "SNR-related metrics" all share a common technical characteristic: they "provide a measure of signal quality which in turn indicates the information carrying capacity of the signaling channel." Holobinko Rebuttal ¶ 17. In other words, each of the '682 Patent's six examples is related to, or like, SNR in that it indicates or measures signal quality. These examples confirm that a POSITA would understand the scope of the term and that it is, therefore, definite.

Third, the '682 Patent provides guidance as to how to select an "SNR-related metric." The specification explains that an "SNR-related metric" is a type of "measured performance metric." '682 Patent, 3:55–59 ("to determine one or more measured performance metric(s) (e.g., an SNR-related metric such as . . .)). An SNR-

related metric must thus be "measured," and it must be a metric of "performance" (as set forth below, performance at the level of the physical signal). The patent also requires a "performance metric," and thus an "SNR-related metric," be a metric that can be used to set "physical layer communication parameters." The specification explains that "SNR over a range of frequencies (an SNR profile)" is an SNR-related metric. *Id.* 3:57–58. It then explains that "***physical layer*** communication parameters may be determined per-[cable modem] based on each CM's respective metric(s) (e.g., each [cable modem's] SNR profile)." *Id.* 4:44–46 (emphasis added). Consistent with this, claim 1 requires that "one or more ***physical layer*** communication parameter" be selected "based on [a] composite SNR-related metric." *Id.* at 8:15–18 (emphasis added).

The specification's description of the broader goal of the invention also provides guidance as to how to identify an SNR-related metric. The specification recognizes that the physical quality of the links positioned between a CMTS and the individual cable modems—in terms of noise and, thus, SNR—may differ. *See e.g., id.* at 5:58–62. The invention relates to a way to select communication parameters, such as the way in which data is modulated, according to the physical channel quality of links connecting the CMTS to groups of modems. *See e.g., id.* at 4:40–43; 5:21–27 ("Physical layer parameters may be configured/coordinated . . . based on measured performance metrics such as SNR profiles"). To accomplish this purpose, the metric used to select the communication parameters—the claimed SNR-related metric—must indicate the physical quality of the channel, just as SNR does. *See* Holobinko Rebuttal ¶¶ 11, 17–18, 25. Thus, the '682 Patent teaches a POSITA that an "SNR-related metric" is something measurable that indicates signal quality or carrying capacity, so that physical layer parameters can be selected. Because the specification provides "criteria for selecting" an SNR-related metric, the term is definite. *See Sonix*, 844 F.3d at 1379.

Defendants' efforts—through their expert, Dr. Chatterjee—to suggest that "SNR-related metric" is indefinite are inconsistent with the technical literature, the intrinsic evidence, and Defendants' own prior positions. First, Dr. Chatterjee argues that the term "is not a term of art, and has no known meaning to a person of skill in the art." Chatterjee Decl. ¶ 80. But Dr. Chatterjee could not even recall any efforts he made to search the technical literature to determine if the term was used. Galluzzo Decl. Ex. H (Chatterjee Deposition Tr.) at 88:1–10, 89:5–14. Unsurprisingly, his conclusion is wrong—patents and technical publications from the relevant time period ***did*** routinely use the term. For example, U.S. Patent Publication No. 2009/0003468 ("Karabulut") explains that "SNR is often not measured directly and other related metrics can be measured instead, such as received signal power" and that "an SNR related metric can be equivalently used." Holobinko Decl. ¶ 48; *see also* Holobinko Exhibit D at ¶ 0027. Tellingly, the example of a "related metric" that Karabulut uses—"signal power"—matches one of the examples in the '682 Patent ("strength of desired signals"). *Compare id.* with '682 Patent, 3:56–59. Similarly, other patents and publications referred to "reporting SNR or another SNR-related metric" or to "a novel SNR-related metric." Holobinko Decl. ¶ 48; *see also* Holobinko Exhibit E (U.S. Pat. No. 7,457,588) at 5:28–31; Holobinko Exhibit F (Lin et al., RANDOM ACCESS HETEROGENEOUS MIMO NETWORKS (2011)) at 152. Each of these references used the term "SNR-related metric" to refer generally to measurements of signal quality. *See e.g.,* Holobinko Decl. ¶ 48. And none provided an explicit definition, underscoring that none was needed because the term was well-understood.

Next, Dr. Chatterjee attempts to fabricate ambiguity by theoretical exercises divorced from the intrinsic disclosure. Dr. Chatterjee proposes that certain "metrics may [or may not], ***in theory***, impact SNR or be impacted by SNR," depending on circumstances. Chatterjee Decl. ¶ 86 (emphasis added). As set forth above, the '682 Patent teaches that whether a metric "may, in theory, impact SNR or be impacted by

SNR" is not the test for whether it is an SNR-related metric. Rather, what matters is whether the metric, ***in reality***, measures the signal quality or carrying capacity, as SNR itself does. *See* Holobinko Rebuttal ¶ 19.

The '682 Patent confirms the distinction between an SNR-related metric and factors that may simply impact SNR. For instance, the location of a modem in a network can "impact" its SNR, as Dr. Chatterjee suggests. *See* Chatterjee Decl. ¶ 91; *see also* Holobinko Rebuttal ¶ 28. But the '682 Patent refers to location as an ***alternative*** to an SNR-related or performance metric, not an example of one. That is, "groupings of [cable modems can be] based on one or both of: measured performance metric(s) ***and*** location within the [] network." '682 Patent at 6:42–45. The intrinsic record thus makes clear: the fact that a metric can ***impact*** SNR does not make it an SNR-related metric. Dr. Chatterjee's musings on how immersing a coaxial cable in water or changing "the ambient heat in a subscriber's home" could "impact" SNR are therefore irrelevant. *See* Chatterjee Decl. ¶ 90. The same is true regarding "throughput" and "latency"—the other theoretical exercises Dr. Chatterjee discusses. Dr. Chatterjee claims to find ambiguity in whether these metrics are "impacted by" SNR in a particular system. *See id.* at ¶¶ 87, 89. But again, the intrinsic evidence makes clear whether a metric is "SNR-related" depends not on whether it is "impacted by" SNR, but whether it measures the same thing as SNR: signal quality or capacity. *See* Holobinko Rebuttal ¶¶ 11, 19. As Dr. Holobinko explains, a POSITA would have no difficulty applying that criterion to "latency" (which does not measure signal quality) or throughput (which does, if it refers to the physical layer as opposed to other confounding factors like slow processors or poor software). *See id.* at ¶¶ 22, 25.

Finally, Dr. Chatterjee's opinions on "SNR-related metric" are inconsistent with opinions expressed by Defendants' other experts. In March, one of the Defendants (Comcast) filed an *inter partes* review (IPR) petition challenging the '682 Patent, with support from a declaration from Dr. Sayfe Kiaei. With respect to a

limitation reciting an "SNR-related metric," Dr. Kiaei was able to apply the teachings of the specification to determine that modulation error rate (MER) was SNR-related: as he concluded, "SNR is related to MER, as if the channel noise increases . . . MER will increase." Holobinko Decl. ¶ 49; *see also* Holobinko Exhibit H (IPR2024-00445, Ex. 1102, Declaration of Sayfe Kiaei) at ¶ 91. Dr. Kiaei thus expressed in a sworn declaration—that is, with reasonable certainty as a person of skill—that MER was an "SNR-related metric" as described in the '682 Patent.

But in his declaration, Dr. Chatterjee expresses the opposite opinion: that a person of skill could not know whether ***any*** metric was an "SNR-related metric" unless it was explicitly named as an example in the '682 Patent (which MER is not). *See* Chatterjee Decl. ¶¶ 83–84. And at his deposition, he testified that "one of ordinary skill would not be able to determine whether [MER] falls within the scope of the claim term SNR-related metric." Galluzzo Decl. Ex. H (Chatterjee Deposition Tr.) at 76:16–23. That others of Defendants' own experts have disagreed with Dr. Chatterjee is yet another reason to disregard his testimony.

In sum, the term SNR-related metric was commonly used at the time the '682 Patent was filed; the '682 Patent uses the term consistently with its well-known meaning and provides substantial guidance on the term's boundaries, along with examples. Dr. Chatterjee's opinions seeking to create ambiguity by irrelevant and theoretical exercises are contrary not only to the intrinsic record, but the opinions of Comcast's other experts. Defendants cannot provide the clear and convincing evidence required to establish indefiniteness. Accordingly, the Court should give the term "SNR-related metric" its plain and ordinary meaning.

VI. CONCLUSION

For the reasons set forth above, Entropic respectfully requests that this Court adopt its proposed constructions of the claim terms at issue.

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CERTIFICATE OF COMPLIANCE

The undersigned, counsel of record for Plaintiff Entropic Communications, LCC, certifies that this brief contains 6,249 words, which complies with the word limit of L.R. 11-6.1.

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